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Solar models and solar neutrinos: a quantitative analysis of the solar composition problem

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"We discuss the status of the standard solar models and we perform a quantitative analysis of the solar composition problem. Even if the problem has been already considered in literature, a thorough self-consistent discussion is missing. While a rigorous approach is not necessary for a qualitative assessment of the problem, it becomes essential if one wants to use the helioseismic information in combination with the solar neutrino results to infer the properties of the Sun. We propose a statistical approach in which all the relevant pieces of information can be combined in a correct and effective way. We use this approach to address the following questions: which is the chemical composition of the sun that can be inferred from helioseismic and solar neutrino data? How different observational information combine in determining the optimal composition of the sun? Do the different observational data show tensions
and/or inconsistencies that may point at some inadequacies in the SSM inputs parameters or assumptions? Which will be the impact of future CNO neutrino flux measurements?"

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